What is claimed is:

1. A ball bearing comprising:

a pair of bearing rings disposed inside and outside in a radial direction;

an annular cage having cylindrical through pockets along said radial direction in several positions on a circumference and incorporated between both said bearing rings; and

a plurality of balls each housed in each said pocket in said annular cage,

wherein said annular cage is guided by one of said bearing rings and

a range (eccentricity tolerance) in which said annular cage can rotate in an eccentric manner between both said bearing rings is included in a range (rattling tolerance) in which said annular cage can move in a state in which said balls are fixed by setting a relationship between a guide clearance α and a pocket clearance β at $\alpha \leq \beta$ if said guide clearance of said annular cage with respect to said one bearing ring is α and said pocket clearance of a pocket inner wall face with respect to said ball is β.

2. The ball bearing according to claim 1, wherein said one bearing ring is an outer ring having a race with a sectional shape corresponding to a part of an arc in an inner peripheral face in an axial intermediate position and

the other of said bearing rings is an inner ring having a race with a sectional shape corresponding to a part of an arc in an outer peripheral face in an axial intermediate position and having a counter bore with a

diameter gradually reducing from said race toward axial one end side.

3. The ball bearing according to claim 1, wherein said one bearing ring is an inner ring having a race with a sectional shape corresponding to a part of an arc in an outer peripheral face in an axial intermediate position and

the other bearing ring is an outer ring having a race with a sectional shape corresponding to a part of an arc in an inner peripheral face in an axial intermediate position and having a counter bore with a diameter gradually increasing from said race groove toward axial one end side.

4. The ball bearing according to claim 1, wherein said guide clearance α is a clearance in a state in which said annular cage is put aside in said radial direction and brought into contact with said one bearing ring and

said pocket clearance β is a clearance in a state in which said annular cage is put aside in an axial direction and brought into contact with said balls.

5. A ball bearing comprising:

a pair of bearing rings disposed inside and outside in a radial direction;

an annular cage having cylindrical through pockets along said radial direction in several positions on a circumference and incorporated between both said bearing rings; and

a plurality of balls each housed in each said pocket in said annular cage,

wherein said annular cage is guided by one of said

bearing rings and

a range (eccentricity tolerance) in which said annular cage can rotate in an eccentric manner between both said bearing rings is included in a range (rattling tolerance) in which said annular cage can move in a state in which said balls are fixed by setting a relationship between a guide clearance α and a pocket clearance β at $x+y < \alpha \leq \beta+x$ if said guide clearance of said annular cage with respect to said one bearing ring is α, said pocket clearance of a pocket inner wall face with respect to said ball is β, an expansion amount of said annular cage in said radial direction due to rotational centrifugal force is x, and an expansion amount of said annular cage in said radial direction due to thermal expansion is y.

6. The ball bearing according to claim 5, wherein races having sectional shapes corresponding to parts of an arc are provided to said inner and outer bearing rings and said balls are in contact with said races in both said bearing rings at predetermined contact angles.

7. A ball bearing comprising:

a pair of bearing rings disposed inside and outside in a radial direction;

an annular cage having cylindrical through pockets along said radial direction in several positions on a circumference and incorporated between both said bearing rings; and

a plurality of balls each housed in each said pocket in said annular cage,

wherein said annular cage is guided by one of said bearing rings and

a range (eccentricity tolerance) in which said

annular cage can rotate in an eccentric manner between both said bearing rings is included in a range (rattling tolerance) in which said annular cage can move in a state in which said balls are fixed by setting a relationship between a guide clearance α and a pocket clearance β at $\alpha max \leq \beta min+x$ and $\alpha min > x+y$ if said guide clearance of said annular cage with respect to said one bearing ring is α, said pocket clearance of a pocket inner wall face with respect to said ball is β, an expansion amount of said annular cage in said radial direction due to rotational centrifugal force is x, an expansion amount of said annular cage in said radial direction due to thermal expansion is y, a maximum value of said guide clearance α is αmax, a minimum value of said guide clearance α is αmin, and a minimum value of said pocket clearance β is βmin.

8. The ball bearing according to claim 4, wherein races having sectional shapes corresponding to parts of an arc are provided to said inner and outer bearing rings and said balls are in contact with said races in both said bearing rings at predetermined contact angles.

9. A ball bearing comprising:

an inner ring having a race with a sectional shape corresponding to a part of an arc on an outer peripheral face in an axial intermediate position and a counter bore with a diameter gradually reducing from said race toward axial one end side;

an outer ring disposed outside said inner ring and concentrically with said inner ring and having a race with a sectional shape corresponding to a part of an arc on an inner peripheral face in an axial intermediate

position;

an annular cage having cylindrical through pockets along said radial direction in several positions on a circumference and incorporated between said inner ring and said outer ring; and

a plurality of balls each housed in each said pocket in said annular cage and rolling in said respective races of said inner ring and said outer ring,

wherein said annular cage is guided by said outer ring and

a range (eccentricity tolerance) in which said annular cage can rotate in an eccentric manner between said inner and outer rings is included in a range (rattling tolerance) in which said annular cage can move in a state in which said balls are fixed by setting a relationship between a guide clearance α and a pocket clearance β at $\alpha \leq \beta$ if said guide clearance of said annular cage with respect to said inner ring is α and said pocket clearance of a pocket inner wall face with respect to said ball is β.

10. A ball bearing comprising:

an inner ring having a race with a sectional shape corresponding to a part of an arc on an outer peripheral face in an axial intermediate position and a counter bore with a diameter gradually reducing from said race toward axial one end side;

an outer ring disposed outside said inner ring and concentrically with said inner ring and having a race with a sectional shape corresponding to a part of an arc on an inner peripheral face in an axial intermediate position;

an annular cage having cylindrical through pockets

along said radial direction in several positions on a circumference and incorporated between said inner ring and said outer ring; and

a plurality of balls each housed in each said pocket in said annular cage and rolling in said respective races of said inner ring and said outer ring,

wherein said annular cage is guided by said outer ring and

a range (eccentricity tolerance) in which said annular cage can rotate in an eccentric manner between said inner and outer rings is included in a range (rattling tolerance) in which said annular cage can move in a state in which said balls are fixed by setting a relationship between a guide clearance α and a pocket clearance β at $x+y < \alpha \leq \beta+x$ if said guide clearance of said annular cage with respect to said inner ring is α, said pocket clearance of a pocket inner wall face with respect to said ball is β, an expansion amount of said annular cage in said radial direction due to rotational centrifugal force is x, and an expansion amount of said annular cage in said radial direction due to thermal expansion is y.

11. A ball bearing comprising:

an outer ring having a race with a sectional shape corresponding to a part of an arc on an inner peripheral face in an axial intermediate position and a counter bore with a diameter gradually increasing from said race toward axial one end side;

an inner ring disposed inside said outer ring and concentrically with said outer ring and having a race with a sectional shape corresponding to a part of an arc on an outer peripheral face in an axial intermediate

position;

an annular cage having cylindrical through pockets along said radial direction in several positions on a circumference and incorporated between said inner ring and said outer ring; and

a plurality of balls each housed in each said pocket in said annular cage and rolling in said respective races of said inner ring and said outer ring,

wherein said annular cage is guided by said inner ring and

a range (eccentricity tolerance) in which said annular cage can rotate in an eccentric manner between said inner and outer rings is included in a range (rattling tolerance) in which said annular cage can move in a state in which said balls are fixed by setting a relationship between a guide clearance α and a pocket clearance β at $\alpha \leq \beta$ if said guide clearance of said annular cage with respect to said inner ring is α and said pocket clearance of a pocket inner wall face with respect to said ball is β.

12. The ball bearing according to claim 11, wherein said eccentricity tolerance of said annular cage is included in said rattling tolerance of said annular cage by setting said relationship between said guide clearance α and said pocket clearance β at $x+y < \alpha \leq \beta+x$ if an expansion amount of said annular cage in said radial direction due to rotational centrifugal force is x and an expansion amount of said annular cage in said radial direction due to thermal expansion is y.